

### **REMARKS**

The foregoing amendment amends claims 1 and 15 and cancels claim 23. Pending in the application are claims 1-22 and 24-47, of which claims 1, 15, 42 and 43 are independent. Claims 42-47 are withdrawn pursuant to a Restriction Requirement. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Claims 1 and 15 are amended to specify that the fluid interface port has a depth equal to a thickness of the associated side wall and a diameter that is significantly larger than the depth and between about 25  $\mu\text{m}$  and about 100  $\mu\text{m}$ . Support for the amendment can be found throughout the application as originally filed, at least, for example on page 15, line 26-page 16, line 9 and, page 21, lines 4-18, and as shown in Figures 2A and 2B.

Claims 1 and 15 are further amended to specify that the virtual wall comprises a meniscus that is substantially co-planar with the side wall in which the virtual wall is formed, as described on page 17, lines 10-16 of the original specification and as shown in Figures 3B, 4A and 9A-9E. *No new matter is added.*

Amendment and/or cancellation of the claims is not to be construed as an acquiescence to any of the objections/rejections set forth in the instant Office Action, and was done solely to expedite prosecution of the application. Applicant reserves the right to pursue the claims as originally filed, or similar claims, in this or one or more subsequent patent applications.

### **Double Patenting**

Claims 15-41 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 and 58-150 of copending Application No. 10/028,852 as characterized by US 2003/0007898. Applicants submit that the claims are patentably distinct from the claims of co-pending U.S. Patent Application No. 10/028,852. If necessary, Applicants will file a terminal disclaimer to overcome the provisional double-patenting rejection.

Finality of the Office Action

The Examiner indicates that the outstanding Office Action is a final Office Action. However, this is the first Office Action after Applicants filed a Request for Continued Examination on 5/18/05. Therefore, the Office Action should be non-final, and the foregoing amendments should be considered.

Claim Rejections Under 35 USC §102

In the Office Action, the Examiner maintains the rejection of claims 1-41 under 35 USC §102(e) as being anticipated by the Barbera-Guillem reference. Applicants traverse the rejection and submit that the pending claims distinguish patentably over the cited references, in particular over the cited Barbera-Guillem reference.

Independent claims 1 and 15 now specify that each fluid interface port has a diameter that is substantially greater than the depth of the fluid interface port to minimize the overall volume of the fluid interface port. The recited fluid interface ports thus have has a disk shape, as shown in Figures 2A and 2B, and described on page 17, lines 19-20, to facilitate *direct* access to the channel interior, a feature not taught or suggested in the cited references.

In addition, claims 1-22 and 24-41 further distinguish over the cited references, because the references fail to disclose a fluid interface port forming a virtual wall having a meniscus surface that is co-planar with a side wall in which it is formed.

For example, the Barbera-Guillem reference describes filling ports 40 and venting apertures 30, which the Examiner considers to be fluid interface ports, that are relatively long, have a large overall volume and a large dead volume, in contrast to the claimed configuration of the claimed fluid interface ports. The Barbera-Guillem reference specifies that “each filling port 40 comprises a *passage* that extends through base 12.” (paragraph 0035) The passage filling ports 40 and venting apertures 30 of Barbera-Guillem, each comprises a channel having a depth that is significantly *larger* than the cross-section of the channel, which prevents direct interfacing of the channel interior with the ambient. The configuration of the filling ports in Barbera-Guillem contrast the disk-shaped configuration of the claimed fluid interface ports.

In addition, even if a meniscus *were* formed in the channel-like ports of Barbera-Guillem, such a meniscus would only be formed in a top portion of the channel-like ports and would therefore not align with the side wall in which the meniscus is formed, as recited in independent claims 1 and 15.

According to the Examiner, the Barbera-Guillem reference discloses a device having a plurality of microchannels and interfaces with a volume of about one nanoliter. According to the Examiner, a “virtual wall” is an interconnecting channel having a volume of about one nanoliter. Therefore, the Examiner considers the Barbera-Guillem reference to disclose the claimed microfluidic device. Applicants respectfully disagree, and submitted in previous Responses to prior Office Actions. However, in view of the amendment to claims 1 and 15, Applicants submit that the amendment overcomes the rejection and clearly distinguishes the claims over the Barbera-Guillem reference.

For at least these reasons, Applicants submit that the claims distinguish patentably over the Barbera-Guillem reference.

#### Claim Rejections Under 35 USC § 103

Claims 1-41 are rejected under 35 USC §103(a) as being unpatentable over Dubrow et al. (U.S. Patent Number 6,251,343) alone or further in view of Barbera-Guillem. Even in combination, the cited references do not disclose the claimed invention.

The Dubrow reference discloses a microfluidic device including relatively large apertures 106 forming ports to channels 114. The ports 106 of Dubrow are not sized and dimensioned to form a virtual wall when the channel network is filled with a liquid, as recited in independent claims 1 and 15.

The Dubrow reference also does not disclose a fluid interface port having a depth that is substantially less than the diameter of the fluid interface port to minimize overall volume. The recited fluid interface ports thus have has a disk shape, as shown in Figures 2A and 2B, and described on page 17, lines 19-20, to facilitate *direct* access to the channel interior, a feature not

taught or suggested in the Dubrow reference. Rather, the depth and diameter of the apertures 106 in Dubrow appear to be about equal, in contrast to the claimed invention.

The Dubrow reference also fails to disclose a fluid interface port forming a virtual wall having a meniscus surface that is co-planar with a side wall in which it is formed. In fact, the Dubrow reference makes no mention of a meniscus at all. Even if a meniscus *were* formed in the ports 106 of Dubrow, the meniscus would not and could not be co-planar with a side wall of a microchannel, but rather, would only be formed in a top portion, middle portion or bottom portion of the port, out of alignment with a side wall of a microchannel.

Furthermore, the Examiner has not pointed to an object reason for combining or modifying the cited references in rendering the conclusion that claims 1-41 are obvious. Therefore, the Examiner fails to make a proper *prima facie* case of obviousness.

For at least these reasons, Applicants respectfully submit that all pending examined claims are patentable, and request that the objections and rejections be reconsidered and withdrawn.

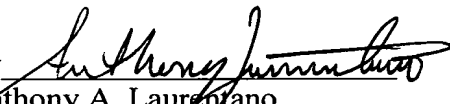
**CONCLUSION**

In view of the above amendment, applicants believe the pending application is in condition for allowance.

Applicants believe no fee is due with this Amendment. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. TGZ-001C from which the undersigned is authorized to draw.

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Respectfully submitted,

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